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AUTHOR Orfitelli, Michael A.
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ABSTRACT

The purpose of this investigation was to identify differences among normal children, learning disabled children, educable mentally handicapped children, and trainable mentally handicapped children in motor skill abilities and to develop profiles to demonstrate these differences. Subjects of the study were all educable and trainable mentally handicapped children in the selected public elementary school system, and a random sampling of normal and learning disabled children. Tests in motor skill abilities were administered to each of the groups. Comparisons of these groups were done both statistically and graphically to determine if any differences or similarities existed among them in motor skill abilities that could give direction necessary for mainstreaming them in physical education classes. Results of tests are presented in the form of graphs, and an analysis of variance is presented. Findings indicated that certain activities lend themselves more to mainstreaming and others to participation in special programs. It was found that in certain activities normal and learning disabled children should not be integrated with trainable mentally handicapped children. It was indicated that certain groups of normal, learning disabled, and educable mentally handicapped children could be integrated and that other groups of educable mentally handicapped and trainable mentally handicapped children could be integrated. (JD)

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AN APPROACH TO MAINSTREAMING THE HANDICAPPED CHILD WITH THE NON-HANDICAPPED CHILD

Attempts to adjust to student needs have resulted in a variety of administrative plans such as homogeneous grouping, departmentalized programs, up-graded schools, and modular scheduling. Mainstreaming the process of integrating learning disabled and mentally handicapped children into classes with non-handicapped children have been initiated in a number of physical education classes in public schools.

One of Anooshian's[1] major conclusions is that the process of integration is justified, although further research was recommended, since one-third of the respondents oppose the process or were unsure of its value. Surveys by Brace, Gross, and Anooshian, and others[1,2,5] have indicated that integration is a prominent procedure in the public schools.

In review of the literature, questions still tend to exist relevant to the efficiency of mainstreaming. Investigations comparing mentally handicapped children to non-handicapped children in measures of motor skill performance do not seem to support the process of mainstreaming. Research stated in comparing the motor skills of normal children, learning disabled children and mentally handicapped children have not been fully inclusive regarding the motor abilities of these children enrolled in public schools. Studies by Rarick and Dobbins[3] have shown that mentally handicapped children and normal children do not differ in factor structures of their motor domains. Their investigations show that some mentally handicapped children were well above the mean of normal children, suggesting that deficiency is not solely a function of subnormal intelligence. Their literature also indicates that mentally handicapped children make substantial gains in motor skills when they are provided with a program

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of competent instruction. However, the vast majority of the literature reviewed suggests that mentally handicapped children might lag well behind children of normal intelligence. In fact, the studies indicate a lag of from two to four years when comparing mentally handicapped and normal children in skill development. Little indications were made to state that mentally handicapped children performed differently in a segregated versus an integrated class.

The purpose of this investigation was to identify differences among normal children, learning disabled children, educable mentally handicapped children, and trainable mentally handicapped children in motor skill abilities, and to subsequently developed profiles that would graphically demonstrate these differences. Thus giving some directioning for mainstreaming.

PROCEDURES

Seventy public, elementary schools in the city of Albuquerque, New Mexico served as a pool for the initial selection of subjects. The subjects ranged in age from 6 years through 9 years, 11 months. A total of 19 schools were utilized with a sample of 36 normal children, 26 learning disabled children, 26 educable mentally handicapped children, and 15 trainable mentally handicapped children with a total population of 103.

The sample was effected by: (1) age range, (2) parent permission, and (3) physical ability to participate in the research. All public schools in Albuquerque, New Mexico, that accommodated educable mentally handicapped and trainable mentally handicapped children were utilized. Random sampling was used to select the normal and learning disabled children who met the criteria for this investigation. Tests in motor skill abilities were administered to each of the groups. Comparisons of these groups were done both statistically and graphically to determine if any differences or

similarities existed among them in their motor skill abilities. These differences and similarities gave the direction necessary for mainstreaming these specific groups. The tests for measurement of motor skill development consisted of the following: simple and choice reaction time, simple and choice movement time, visual pursuit rotor tracking, static and dynamic balance, grip strength, and the vertical jump, pass and catch, and the zig-zag run from the JOHNSON'S FUNDAMENTAL SKILL TEST BATTERY. All subjects were administered these tests by the author and his assistant, who both had awarded degrees in physical education. The results were recorded on the subjects' score sheets for final computation. The procured data was subject to analysis of variance in an effort to determine significant differences among the means of the four specific groups on variables of physical motor skill abilities. Because motor skill tests consisted of eleven variables, a factor analysis was utilized to reduce the variables, thus giving less chance of probability error. The Newman-Kauls test was employed if a significant F resulted.

RESULTS

The factored mean differences in specific motor skills of normal, learning disabled, educable mentally handicapped, and trainable mentally handicapped children were compared using an analysis of variance. The results are shown in Tables 1, 1A, 2, 2A, and in Graphic Profiles A through K. The resultant F was found to be significant, indicating there was a difference in specific motor skills of N, LD, EDM, and TMH children.

When graphically portraying the profiles on motor skill abilities, the group mean scores obtained from the factor analysis were utilized to indicate the percentage of N, LD, EMH, AND TMH children having similar test scores. Each profile was divided and given a letter symbol.

TABLE 1

ANALYSIS OF VARIANCE IN REACTION TIME OF NORMAL, LEARNING DISABLED, EDUCABLE MENTALLY HANDICAPPED, AND TRAINABLE MENTALLY HANDICAPPED CHILDREN

Source	DF	SS	MS	F	Sig.
Between Groups	3	18.3183	6.1061	7.2239	.05*
Within Groups	99	83.6810	0.8453		
Total	102	101.9993			

*Significant at 0.05 level

TABLE 1A

NEWMAN KAULS TEST OF SIGNIFICANCE IN REACTION TIME

	N	LD	EMH	TMH
N	0			
LD	.16	0		
EMH	.56*	.40*	0	
TMH	1.23*	1.08*	.67*	0

*Significant at 0.05 level

TABLE 2

ANALYSIS OF VARIANCE IN STRENGTH, BALANCE, AND HAND-EYE COORDINATION OF NORMAL, LEARNING DISABLED, EDUCABLE MENTALLY HANDICAPPED, AND TRAINABLE MENTALLY HANDICAPPED CHILDREN

Source	DF	SS	MS	F	Sig.
Between Groups	3	51.5194	17.1731	33.6795	.05*
Within Groups	99	50.4799	0.5099		
Total	102	101.9993			

*Significant at 0.05 level

TABLE 2A

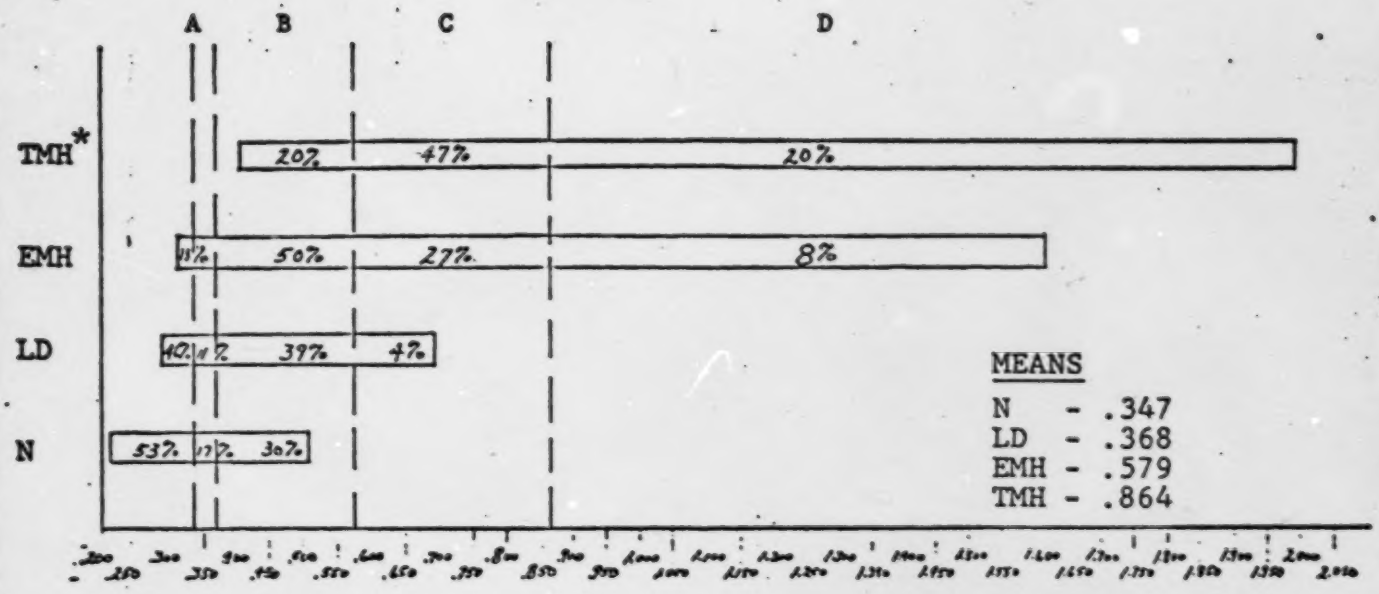
NEWMAN KAULS TEST OF SIGNIFICANCE IN STRENGTH, BALANCE, AND HAND-EYE COORDINATION

	N	LD	EMH	TMH
N	0			
LD	.18*	0		
EMH	.96*	.78*	0	
TMH	2.03*	1.85*	1.07*	0

*Significant at 0.05 level

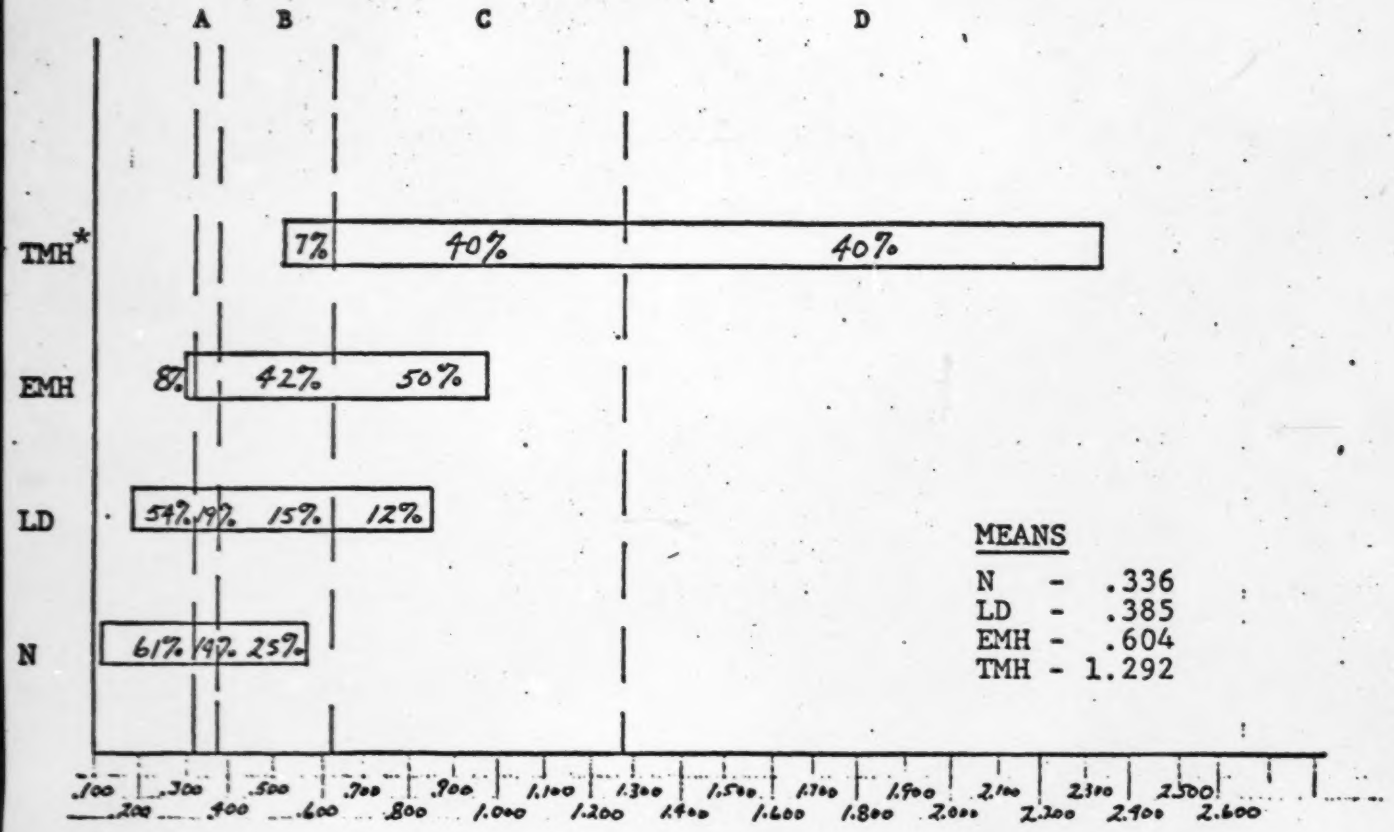
Graphic Profile A on simple reaction time is divided into four groups. Please note that the lower the score, the greater the performance: Group A includes all children on or above the group mean of .368; Group B includes all children on or above the group mean of .579, but below .368; Group C includes all children on or above the group mean of .864, but below .579; and Group D includes all children below the group mean of .864. The following is the percentage of children from each specific group tested that compared Groups A, B, C, and D: 70 percent (25) N, 57 percent (15) LD and 15 percent (4) EMH children were in Group A; 30 percent (11) N, 39 percent (10) LD, 50 percent (13) EMH and 20 percent (3) TMH children were in Group B; 4 percent (11) LD, 27 percent (7) EMH, and 47 percent (7) TMH children were in Group C; and 8 percent (2) EMH and 20 percent (3) TMH children were in Group D. Thirteen percent (2) of TMH children, after repeated instruction on the reaction time test, were destructive towards the machinery and would not respond to the test.

Graphic Profile B on simple movement time is divided into 4 groups. Please note that the lower the score the greater the performance: Group A includes all children on or above the group mean of .385; Group B includes all children on or above the group mean of .604, but below .385; Group C includes all children on or above the group mean of 1.292, but below .604; and Group D includes all children below the group mean of 1.292. The following is the percentage of children from each specific group tested that comprises Groups A, B, C, and D: 75 percent (27) N, 73 percent (19) LD, and 8 percent (2) EMH children were in Group A; 25 percent (9) N, 15 percent (4) LD, 42 percent (11) EMH, and 7 percent (1) TMH children were in Group B; 12 percent (3) LD, 50 percent (13) EMH, and 40 percent (6) TMH children were in Group C; and 40 percent (6) children were in



*Note: 13% of the TMH children would not respond to test.

Profile A Simple Reaction Time of Normal, Learning Disabled, Educable Mentally Handicapped, and Trainable Mentally Handicapped Children



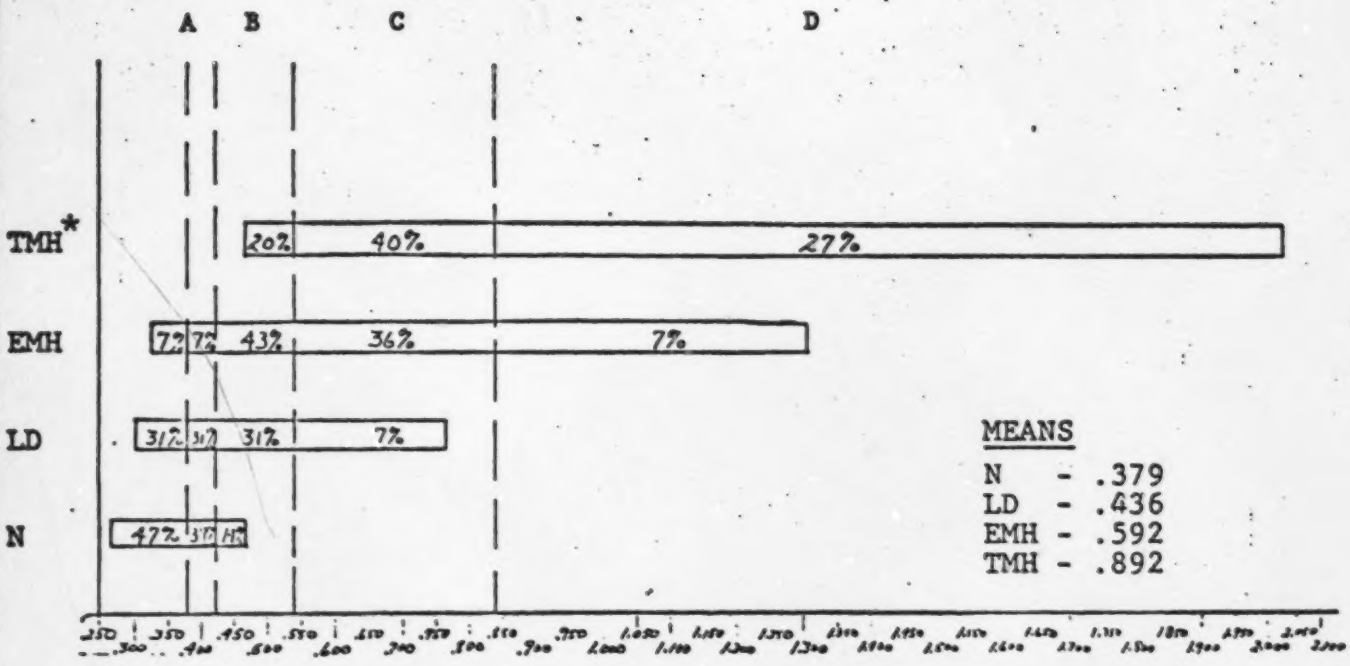
*Note: 13% of the TMH children would not respond to test

Profile B Simple Movement Time of Normal, Learning Disabled, Educable Mentally Handicapped, and Trainable Mentally Handicapped Children

Group D. Thirteen percent (2) of TMH children, after repeated instruction on simple movement time tests, were destructive towards the machinery and would not respond to the tests.

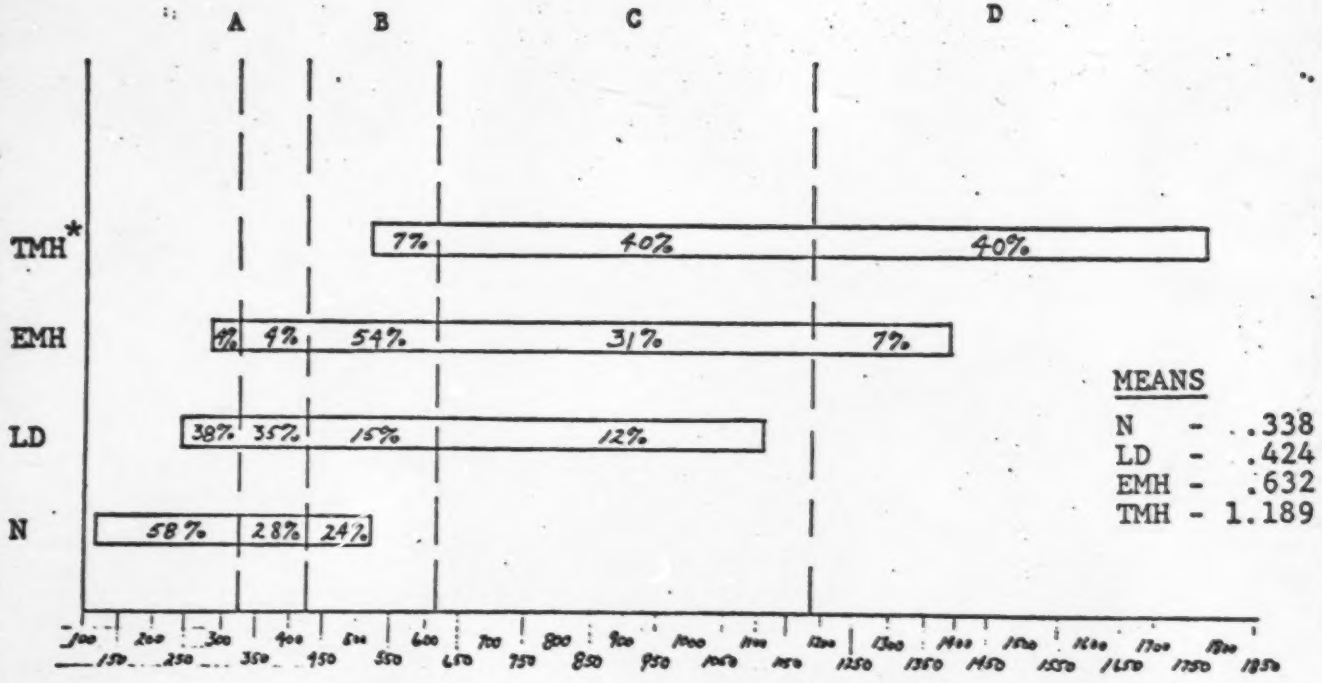
Graphic Profile C on choice reaction time is divided into four groups. Please note that the lower the score, the greater the performance: Group A includes all children on or above the group mean of .436; Group B includes all children on or above the group mean of .592, but below .436; Group C includes all children on or above the group mean of .892, but below .592; and Group D includes all children below the group mean of .892. The following is the percentage of children from each specific group tested that comprised Groups A, B, C, and D: 86 percent (31) N, 62 percent (16) LD, and 14 percent (4) EMH children were in Group A; 14 percent (5) N, 31 percent (8) LD, 43 percent (11) EMH and 20 percent (3) TMH children children were in Group B; 7 percent (2) LD, 36 percent (9) EMH children, and 40 percent (6) TMH children were in Group C; and 7 percent (2) EMH, and 27 percent (4) TMH children were in Group D. Thirteen percent (2) of TMH children, after repeated instruction of the choice reaction time tests, were destructive towards the machinery and would not respond to the tests.

Graphic Profile D on choice movement time is divided into four groups. Please note that the lower the score, the greater the performance: Group A includes all children on or above the group mean of .424; Group B includes all children on or above the group mean of .632, but below .424; Group C includes all children on or above the group mean of 1.189, but below .632; and Group D includes all children below the group mean of 1.189. The following is the percentage of children from each specific group tested that comprised Groups A, B, C, and D: 86 percent (31) N, 73 percent (19) LD, and 8 percent (2) EMH children were in Group A; 14 percent (5) N,



*Note: 13% of the TMH children would not respond to test.

Profile C Choice Reaction Time of Normal, Learning Disabled, Educable Mentally Handicapped, and Trainable Mentally Handicapped Children



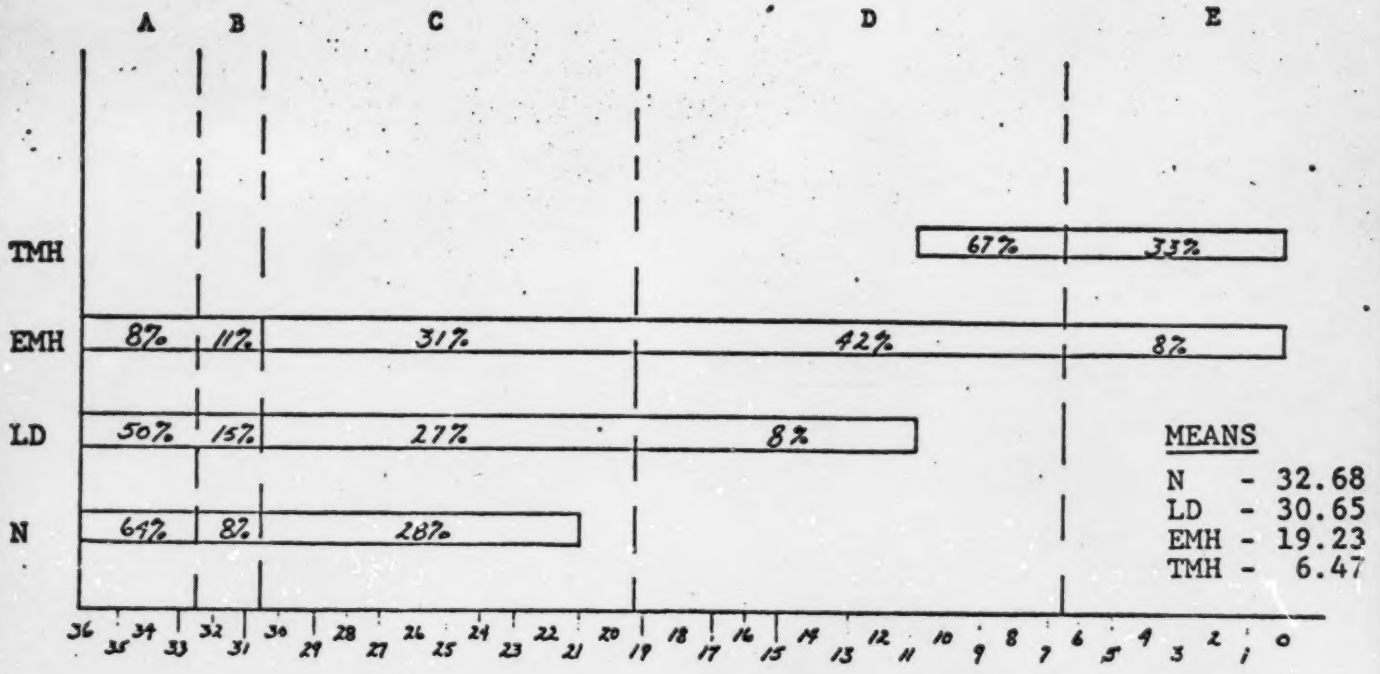
*Note: 13% of the TMH children would not respond to test.

Profile D Choice Movement Time of Normal, Learning Disabled, Educable Mentally Handicapped, and Trainable Mentally Handicapped Children

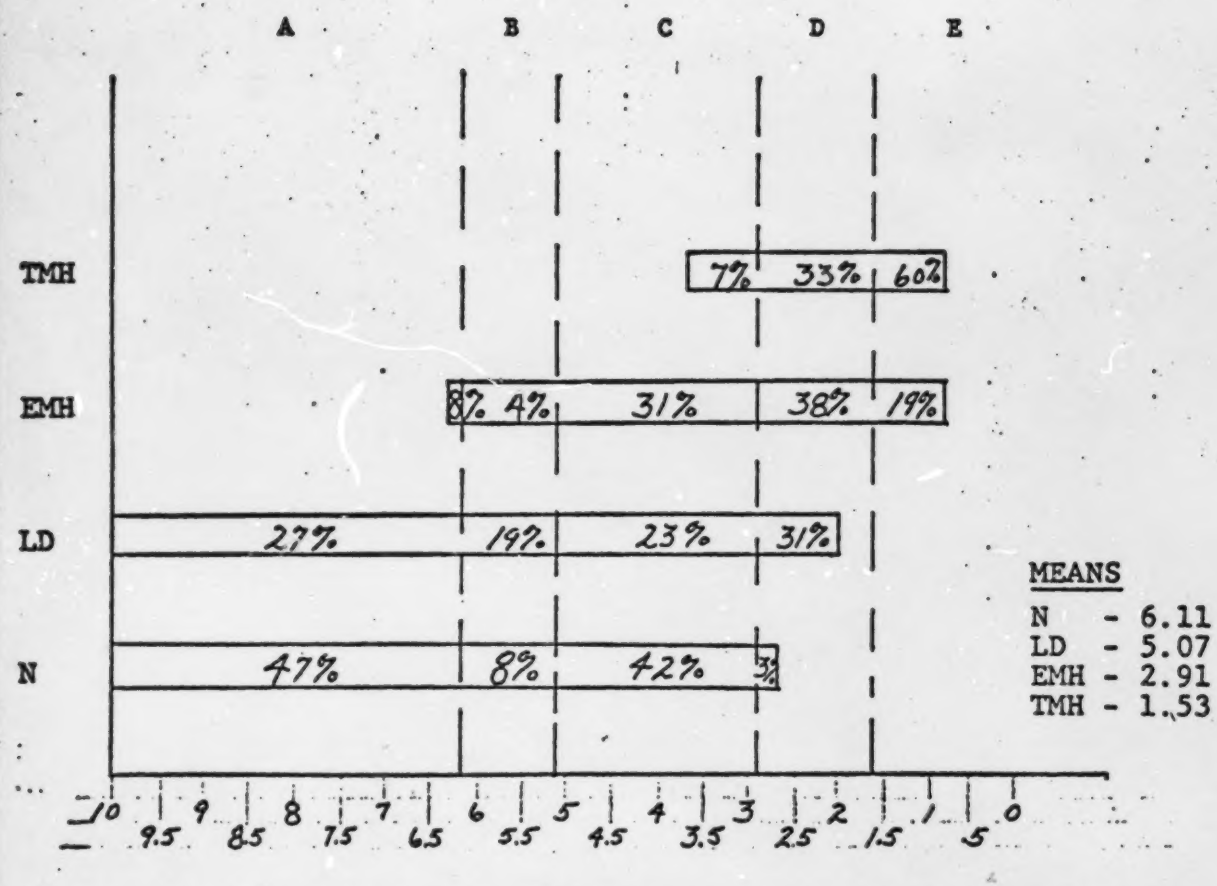
15 percent (4) LD, 54 percent (14) EMH, and 7 percent (1) TMH children were in Group B; 12 percent (3) LD, 31 percent (8) EMH, and 40 percent (6) TMH children were in Group C; and 7 percent (2) EMH and 40 percent (6) TMH children were in Group D. Thirteen percent (2) of TMH children, after repeated instruction on choice movement time tests, were destructive towards the machinery and would not respond to the tests.

Graphic Profile E on dynamic balance is divided into five groups: Group A includes all children on or above the group mean of 32.68; Group B includes all children on or above the group mean of 30.65, but below 32.68; Group C includes all children on or above the group mean of 19.23, but below 30.65; Group D includes all children on or above the group mean of 6.47, but below 19.23; and Group E includes all children or or above the group mean of 6.47. The following is the percentage of children from each specific group tested that comprised Groups A, B, C, D, and E: 64 percent (23) N, 50 percent (13) LD, and 8 percent (2) EMH children were in Group A; 8 percent (3) N, 15 percent (4) LD, and 11 percent (3) EMH children were in Group B; 28 percent (10) N, 27 percent (7) LD, and 31 percent (8) EMH children were in Group C; 8 percent (2) LD, 42 percent (11) EMH and 67 percent (10) TMH children were in Group D; and 8 percent (2) EMH and 33 percent (5) TMH children were in Group E.

Graphic Profile F on static balance is divided into 5 groups: Group A includes all children on or above the group mean of 6.11; Group B includes all children on or above the group mean of 5.07, but below 6.11; Group C includes all children on or above the group mean of 2.91, but below 5.07; Group D includes all children on or above the group mean of 1.53, but below 2.91; and Group E includes all children below the group mean of 1.53. The following is the percentage of children from each specific group tested that



Profile E Dynamic Balance of Normal, Learning Disabled, Educable Mentally Handicapped, and Trainable Mentally Handicapped Children.

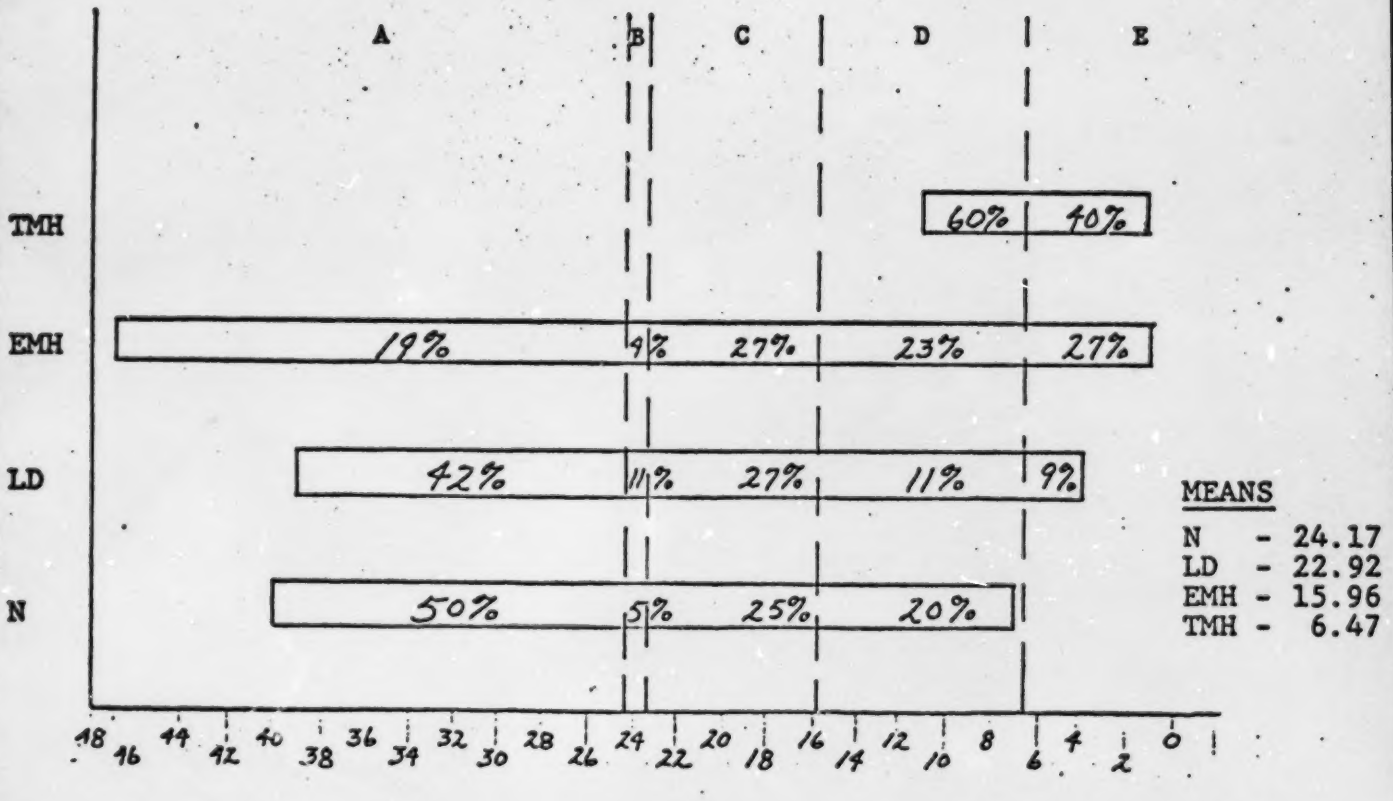


Profile F Static Balance of Normal, Learning Disabled, Educable Mentally Handicapped, and Trainable Mentally Handicapped Children

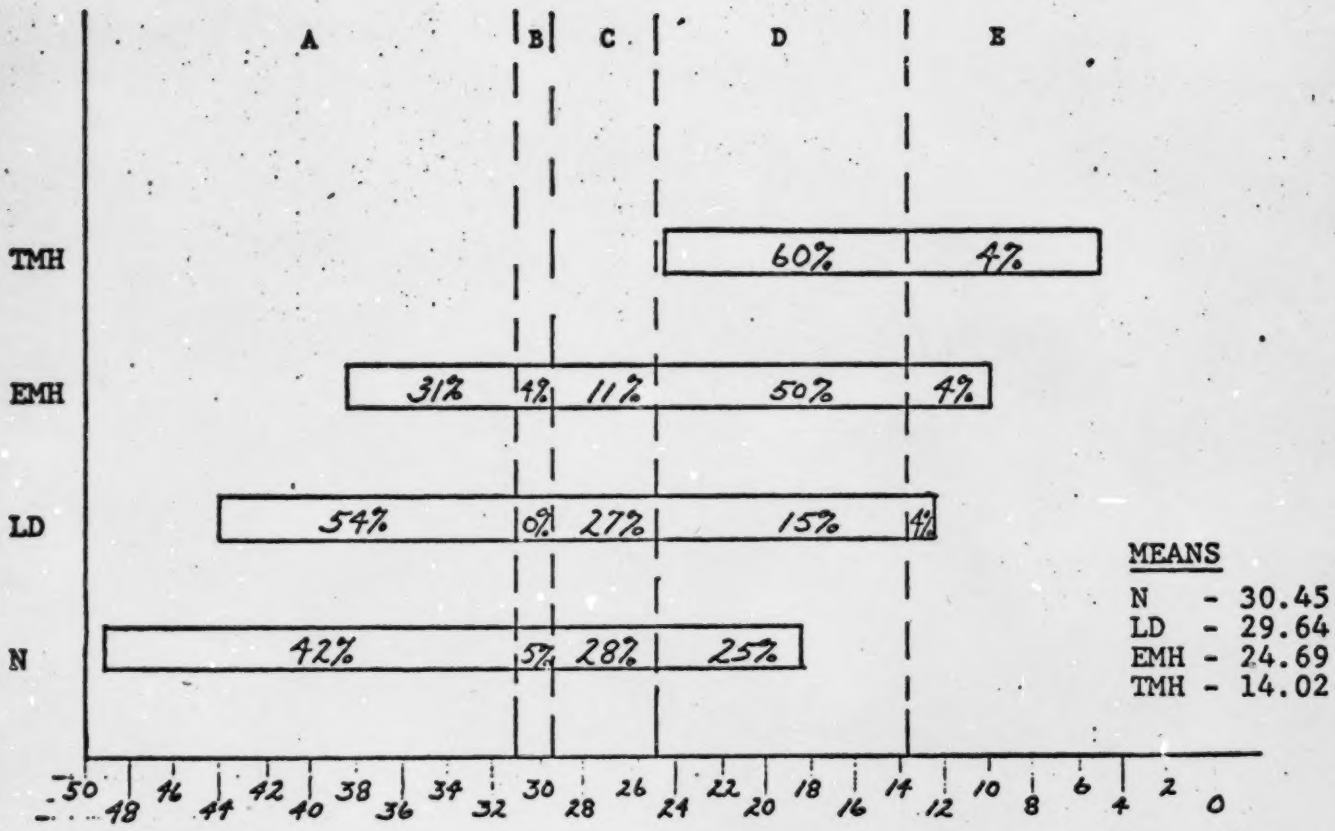
and 8 percent (2) EMH children were in Group A; 8 percent (3) N, 19 per-comprised Groups A, B, C, D, and E: 47 percent (17) N, 27 percent (7) LD, and 8 percent (2) EMH children were in Group A; 8 percent (3) N, 19 percent (5) LD, and 4 percent (1) EMH children were in Group B; 42 percent (15) N, 23 percent (6) LD, 31 percent (8) EMH, and 7 percent (1) TMH children were in Group C; 3 percent (1) N, 31 percent (8) LD, 38 percent (10) EMH, and 33 percent (5) TMH children were in Group D; and 19 percent (5) EMH, and 16 percent (9) TMH children were in Group E.

Graphic Profile G on pass and catch is divided into 5 groups: Group A includes all children on or above the group mean of 24.17; Group B includes all children on or above the group mean of 22.92, but below 24.17; Group C includes all children on or above the group mean of 15.96, but below 22.92; Group D includes all children on or above the group mean of 6.47, but below 15.96; and Group E includes all children below the group mean of 6.47. The following is the percentage of children from each specific group tested that comprised Groups A, B, C, D, and E: 50 percent (18) N, 42 percent (11) LD, and 19 percent (5) EMH children were in Group A; 5 percent (2) normal children, 11 percent (3) LD, and 4 percent (1) EMH were in Group B; 25 percent (9) N, 27 percent (7) LD, and 27 percent (7) EMH children were in Group C; 20 percent (7) N, 11 percent (3) LD, 23 percent (6) EMH, and 60 percent (9) TMH children were in Group D; and 9 percent (2) LD, 27 percent (7) EMH, and 40 percent (6) TMH children were in Group E.

Graphic Profile H on grip strength is divided into 5 groups: Group A includes all children on or above the group mean of 30.47; Group B includes all children on or above the group mean of 29.64, but below 30.47; Group C



Profile G Pass and Catch of Normal, Learning Disabled, Educable Mentally Handicapped, and Trainable Mentally Handicapped Children

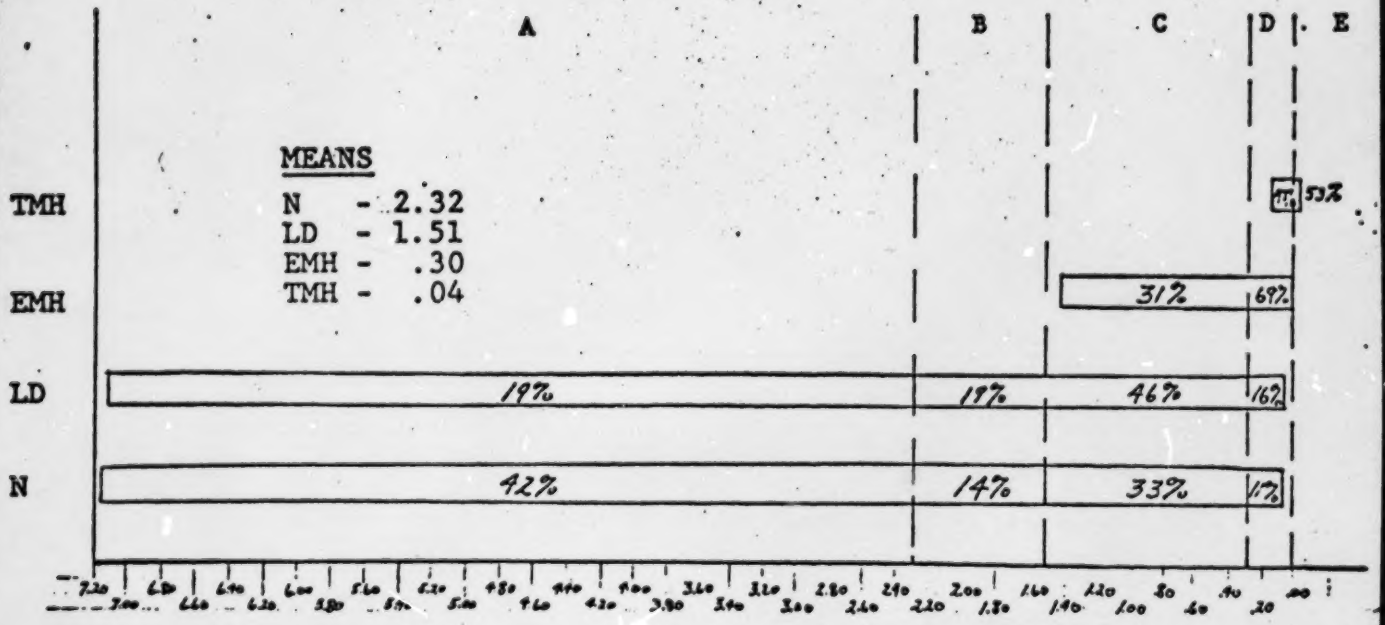


Profile H Grip Strength of Normal, Learning Disabled, Educable Mentally Handicapped, and Trainable Mentally Handicapped Children

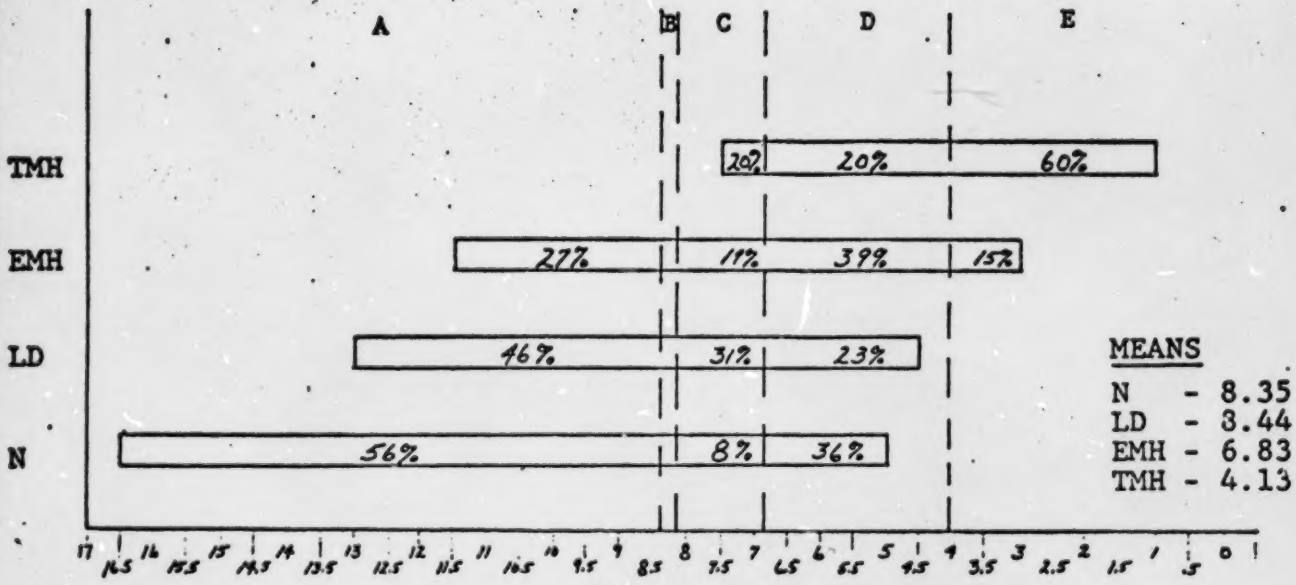
includes all children on or above the group mean of 24.64, but below 29.67; Group D includes all children on or above the group mean of 14.02, but below 24.69; and Group E includes all children below the group mean of 14.02. The following is the percentage of children from each specific group tested that comprised Groups A, B, C, D, and E: 42 percent (15) N, 54 percent (14) LD, and 31 percent (8) EMH children were in Group A; 5 percent (2) N, and 4 percent (1) LD children were in Group B; 28 percent (10) N, 27 percent (7) LD, and 11 percent (3) EMH children were in Group C; 25 percent (9) N, 15 percent (4) LD, 50 percent (13) EMH, and 60 percent (9) TMH children were in Group D; and 4 percent (1) LD, 4 percent (1) EMH, and 40 percent (6) TMH children were in Group E.

Graphic Profile I on tracking is divided into 5 groups: Group A includes all children on or above the group mean of 2.32; Group B includes all children on or above the group mean of 1.51, but below 2.32; Group C includes all children on or above the group mean of .30, but below 1.51; Group D includes all children or above the group mean of .04, but below .30; and Group E includes all children below the group mean of .04. The following is the percentage of children from each specific group tested that comprised Groups A, B, C, D, and E: 42 percent (15) N, and 19 percent (5) LD children were in Group A; 14 percent (5) N, and 19 percent (5) LD children were in Group B; 33 percent (12) N, 46 percent (12) LD, and 31 percent (8) EMH children were in Group C; 11 percent (4) N, 16 percent (4) LD, 69 percent (18) EMH and and 47 percent (7) TMH children were in Group D; and 53 percent (8) TMH children were in Group E.

Graphic Profile J on vertical jump is divided into 5 groups: Group A includes all children on or above the group mean of 8.44; Group B includes all children on or above the group mean of 8.35, but below 8.44; Group C



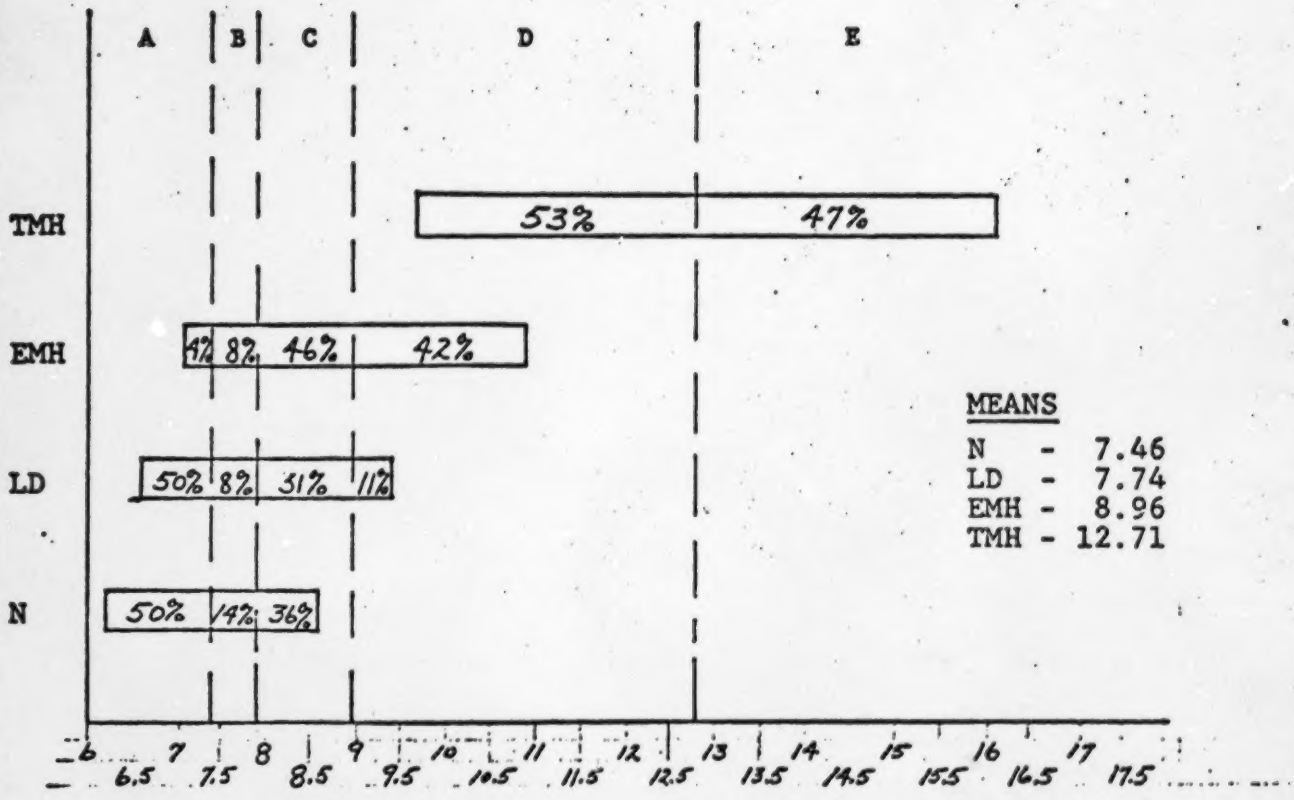
Profile I. Tracking of Normal, Learning Disabled, Educable Mentally Handicapped, and Trainable Mentally Handicapped Children



Profile J Vertical Jump of Normal, Learning Disabled, Educable Mentally Handicapped, and Trainable Mentally Handicapped Children.

includes all children on or above the group mean of 6.83, but below 8.35; Group D includes all children on or above the group mean of 4.13, but below 6.83; and Group E includes all children below the group mean of 4.13. The following is the percentage of children from each specific group tested that comprised Groups A, B, C, D, and E; 56 percent (20) N, 46 percent (12) LD, and 27 percent (7) EMH children were in Group A; Group B included none of the specific groups; 8 percent (3) N, 31 percent (8) LD, 19 percent (5) EMH and 20 percent (3) TMH children were in Group C; 36 percent (13) N, 23 percent (6) LD, 39 percent (10) EMH, and 20 percent (3) TMH children were in Group D; and 15 percent (4) EMH, and 60 percent (9) TMH children were in Group E.

Graphic Profile K on zig-zag run is divided into 5 groups. Please note that the lower the score the greater the performance. Group A includes all children on or above the group mean of 7.46; Group B includes all children on or above the group mean of 7.74, but below 7.46; Group C includes all children on or above the group mean of 8.96, but below 7.46; Group D includes all children on or above the group mean of 12.71, but below 8.96; and Group E includes all children below the group mean of 12.71. The following is the percentage of children from each specific group tested that comprised Groups A, B, C, D, and E: 50 percent (18) N, 50 percent (13) LD, and 4 percent (1) EMH children were in Group A; 14 percent (5) N, 8 percent (2) LD, and 8 percent (2) EMH children were in Group B; 36 percent (13) N, 31 percent (8) LD, and 36 percent (12) EMH children were in Group C; 11 percent (3) LD, 42 percent (11) EMH, and 53 percent (8) TMH children were in Group D; and 47 percent (7) TMH children were in Group E.



Profile K Zig-Zag Run of Normal, Learning Disabled, Educable Mentally Handicapped, and Trainable Mentally Handicapped Children

CONCLUSIONS

The following conclusions appear justified:

1. Young N and LD children were similar in their abilities to perform reaction time and movement time skills.
2. Young N and LD children were significantly different from EMH and TMH children when comparing their abilities to perform reaction time and movement time skills.
3. Young EMH children were significantly different when compared to TMH children regarding their abilities to perform reaction time and movement time skills.
4. Young N children were significantly different from LD, EMH, and TMH children when comparing their abilities to perform motor skills involving pass and catch, grip strength, static balance, dynamic balance, tracking, vertical jump, and the zig-zag run.
5. Young LD children were significantly different from EMH and TMH children in their abilities to perform motor skills involving pass and catch, grip strength, static balance, dynamic balance, tracking, vertical jump, and the zig-zag run.
6. Young EMH children were significantly different from TMH children in their abilities to perform motor skills involving pass and catch, grip strength, static balance, dynamic balance, tracking, vertical jump, and the zig-zag run.

SUMMARY

This investigation sought to find both statistically and by profile dev. if any differences or similarities existed among and between groups of N, LD, EMH and TMH children for the purpose of mainstreaming. The statistical results of this study, like many others, found a difference among

the group means; this result gives little directions for mainstreaming. The profiles were developed in part to determine the feasibility of integrating the specific groups of this investigation into physical education programs. Surveys by Anooshian, Thurstone, Brace, and Gross (1,8,2,5) have indicated the predominace of integrated programs of physical education throughout the United States. Yet, very little empirical evidence is provided that could suppport the process of mainstreaming. The significance of this investigation is that it is directed towards mainstreaming LD, EMH and TMH children. Not only that but, through the graphic profiles developed, the investigation has answered, in part, the question of whether certain activities lend themselves more to mainstreaming and others to participation in special programs.

Findings derived from the pass and catch, grip strength, and vertical jump profiles suggested that all the groups tested could possibly be integrated, while the static balance, dynamic balance, track reaction time, and zig-zag run profiles indicated that N and LD children should not be integrated with TMH children. The study indicated that certain groups of N, LD, and EMH children could be integrated and that other groups of EMH and TMH children could be integrated. Other variables such as age and social maturity must also be considered before final decisions are made on mainstreaming.

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